

## Evaluation of Environmental Radiation Monitoring Results

March 26, 2011 18:55

Nuclear Safety Commission

The Nuclear Safety Commission evaluates the Environmental Radiation Monitoring Result published by MEXT (Ministry of Education, Culture, Sports, Science and Technology). The evaluation results based on the information published between March 25, 2011, 16:00 and March 26, 16:00 are described below:

### 1. Spatial radiation dose rate

- Observation of spatial radiation dose rate at a distance of 20km or more from Fukushima 1st Nuclear Power Plant found a relatively higher dose rate locally at several measuring points. It however does not reach the level that affects human body.

We need to further watch the variation of dose rate carefully, considering other factors such as weather and wind direction.

- Some area that exceeds  $100\mu\text{Sv/h}$  (Note 1) may reach the indoor sheltering index ( $10\text{mSv}$  to  $50\text{mSv}$ ) (Note 2). The area is still limited; for the time being, there are no needs to change the indoor sheltering area (see Reference 1).

### 2. Radioactivity in the air

- With regard to the measuring results of dust samplings, currently, maximum I-131 radioactivity is  $43\text{Bq/m}^3$  ( $4.3 \times 10^{-5}\text{Bq/cm}^3$ ); maximum Cs-137 radioactivity density is  $2.5\text{Bq/m}^3$  ( $2.5 \times 10^{-6}\text{Bq/cm}^3$ ).

- For I-131, the value exceeds the concentration limit (Note 3). Considering that the half-life period of I-131 is such a short period as about 8 days, this concentration does not affect people's health immediately. We, however, need to watch the sampling results carefully.
- Added is the dust sampling measuring result since May 16 at the equidistance with same interval from Fukushima 1st Nuclear Power Plant. According to the measured results, relatively higher values were obtained in the south of the Fukushima 1st Nuclear Power Plant. We still need to watch the sampling result carefully since it is important to qualitatively figure out the effect to the peripheral areas.

### 3. Aviation monitoring

- Measuring result from aviation monitoring is added. To figure out the proliferation of emitted radioactive material, we have requested the radioactive material sampling at the low altitude and low-speed.

### 4. Environmental samples

- Monitoring results have been obtained on the land water (pond water or rain water), soil and fallout and sea water.  
Weed and land water showed a relatively higher values; we further need continued measurement on the drinking water and foods. We also need to continue environmental monitoring, in view of various elements such as change of weather.
- It is considered that the concentration of radioactive material discharged in the sea water will be considerably thinned since it is proliferated along with the tidal current before actually ingested by marine life such as fish and seaweed. Since the I-131 has a relatively shorter half-life period, 8 days, it is assumed that its activity will be substantially decreased before people take such marine foods.

5. Environmental radioactivity level survey by prefectures

1) Spatial radiation dose rate

Some prefectures showed a higher value compared with the average values before the accident; however, it will not immediately affect people's health.

2) Drinking water (tap water)

- In the prefectures of Fukushima, Ibaraki, Tochigi, Gunma, Saitama and Tokyo, measured results of drinking water (tap water) are 78Bq/kg for I-131 and 7.6Bq/kg for Cs-137 at maximum.
- For drinking water (tap water), the values satisfy the index on the drink and food ingestion (Note 4) in all prefectures. We still need to be aware of the information on requirement issued by MHLW (Ministry of Health, Labor and Welfare).
- We must further watch the transition of drinking water (tap water), in view of weather and wind direction

We consider that further monitoring is needed.

(Note 1) In Namie-cho, about 30km northwest of the Fukushima 1st Nuclear Power Plant (location 32, measuring result in March 26, 11:01 was 45 $\mu$ Sv/h; location 33, measuring result in March 26, 11:12 was 21 $\mu$ Sv/h)

(Note 2) "Disaster Prevention Countermeasure on Nuclear Facility"(Adopted in June 30, 1980, Nuclear Safety Commission)  
(<http://www.nsc.go.jp/shinsashishin/pdf/history/59-15.pdf>)

(Note 3) Limit of the radioactivity in the air outside the peripheral monitoring area boundary as specified by the law is:  
5 $\times 10^{-6}$ Bq/cm<sup>3</sup> for I-131 and 3 $\times 10^{-5}$ Bq/cm<sup>3</sup> for Cs-137.

(Note 4) “Disaster Prevention Countermeasure on Nuclear Facility”(Adopted in June 30, 1980, Nuclear Safety Commission), Index concerning the limited ingestion of food and drink (drinking water) are 300Bq/kg for I-131 and 200Bq/kg for Cs-137.

With regard to measurement results at location 32, Nuclear Safety Commission has published requirements and opinions as listed below:

○March 18, 2011, 13:00

The level, not affecting the human body, is equivalent to the indoor sheltering index (10mSv) when applied for 2.5 days. NISA (Nuclear & Industrial Safety Agency) is requested to check if there are no houses in the area.

○ March 18, 2011, 19:00

When considering the current and future variation, the level will not affect the human body and it will reach the lower limit value of indoor sheltering-related index (range: 10mSv to 50mSv) in about 3 days. If this condition further continues, partial revision must be considered for the indoor sheltering area. MEXT is requested to install the integrating dose meters and watch the variation carefully.

○ March 19, 2011, 9:30

The level will not affect the human body and it will reach the lower limit value of indoor sheltering-related index (range: 10mSv to 50mSv) in about 3 days. If this condition further continues, partial revision must be considered for the indoor evacuation area. MEXT is requested to install the integrating dose meter and watch the variation carefully.

○ March 20, 2011, 8:00

The level will not affect the human body. It may though reach the lower limit of indoor sheltering-related index (10mSv to 50mSv); its area is still limited and dose equivalent rate is decreasing. We thus assume that no immediate changes are needed for the indoor sheltering area.

We must watch carefully the variation of dose equivalent rate, in view of weather and wind direction especially in the above mentioned area.

○ March 21, 2011, 11:00

The level will not affect the human body. It may though reach the lower limit of indoor sheltering-related index (10mSv to 50mSv); its area is still limited and dose equivalent rate is decreasing. We thus assume that no immediate changes are needed for the indoor sheltering area.

We must watch carefully the variation of dose equivalent rate, in view of the weather and wind direction especially in the above mentioned area.

○ March 22, 2011, 9:00

The level will not affect the human body. It may though reach the lower limit of indoor sheltering-related index (10mSv to 50mSv); its area is still limited and dose equivalent rate is decreasing. We thus assume that no immediate changes are needed for the indoor sheltering area.

We must watch carefully the variation of dose equivalent rate, in view of weather and wind direction especially in the above mentioned area.

\* Measurement result at location 32 in March 21, 10:40 (90 $\mu$ Sv/h)

○ March 22, 2011, 18:00

The level will not affect the human body. It may though reach the lower limit of indoor sheltering-related index (10mSv to 50mSv); its area is still limited and dose equivalent rate is decreasing. We thus assume that no immediate changes are needed for the indoor sheltering area.

We must watch carefully the variation of dose equivalent rate, in view of weather and wind direction especially in the above mentioned area.

\*Measurement result at location 32 in March 22, 11: 10 (75 $\mu$ Sv/h)

○ March 23, 2011, 10:00

The level may though reach the lower limit of indoor sheltering-related index (10mSv to 50mSv); its area is still limited and dose equivalent rate is decreasing. We thus assume that no immediate changes are needed for the indoor sheltering area.

We still need to watch carefully the variation of dose equivalent rate, in view of weather and wind direction.

\* Measurement result at location 32 in March 22, 11:10 (75 $\mu$ Sv/h)

Measurement result at location 33 in March 22, 9:30 (95 $\mu$ Sv/h)

○ March 24, 2011, 8:30

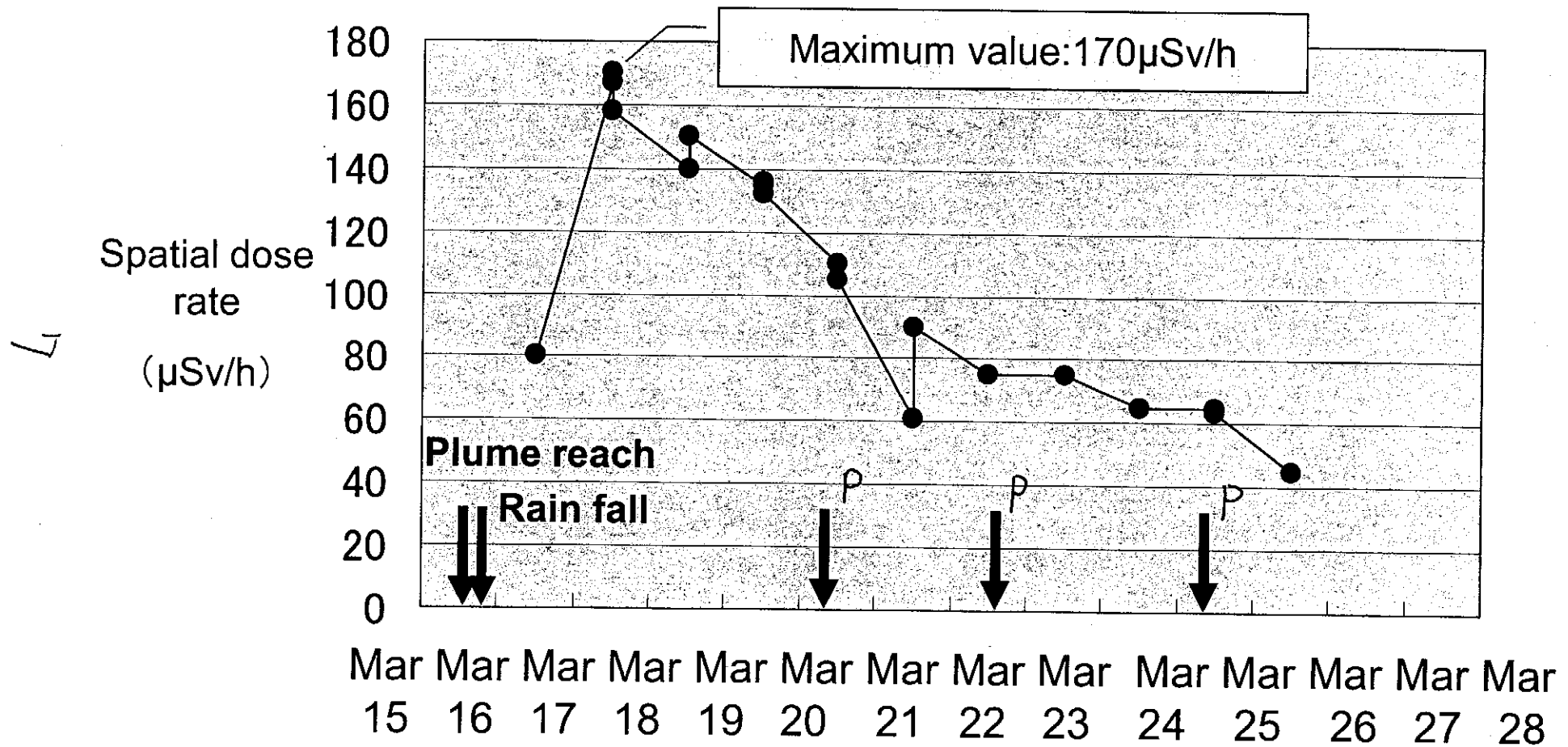
The level may though reach the lower limit of indoor sheltering-related index (10mSv to 50mSv); its area is still limited and dose equivalent rate is decreasing. We thus assume that no immediate changes are needed for the indoor sheltering area.

We still need to watch carefully the transition of dose equivalent rate, in view of weather and wind direction.

\* Measurement result at location 32 in March 23, 12:14 (75 $\mu$ Sv/h)

Measurement result at location 33 measuring locations in March 23, 9:30 (103 $\mu$ Sv/h)

# Variation of spatial dose rate (point 32: about 30km northwest)



■ Calculation based on MEXT environmental monitoring results

Radiation dosage derived from spatial dose rate (evaluation at point 32 about 30km northwest)					
Area name	Measurement value	Interval until next measurement	Evaluation term (1/2 allotted before and after)	Radiation dosage during evaluation	Measurement date/time
	μSv/h	h	h	mSv	
					2011/3/15 15:00
32	80	25.7	33.4	2.7	2011/3/16 11:30
32	167	0.8	13.3	2.2	2011/3/17 13:10
32	170	1.0	0.9	0.2	2011/3/17 14:00
32	158	20.5	10.8	1.7	2011/3/17 15:00
32	140	1.0	10.8	1.5	2011/3/18 11:33
32	140	1.0	1.0	0.1	2011/3/18 12:33
32	150	19.8	10.4	1.6	2011/3/18 13:32
32	135	1.0	10.4	1.4	2011/3/19 9:20
32	136	1.0	1.0	0.1	2011/3/19 10:20
32	132	25.7	13.4	1.8	2011/3/19 11:20
32	110	1.0	13.4	1.5	2011/3/20 13:03
32	110	1.0	1.0	0.1	2011/3/20 14:03
32	105	19.1	10.1	1.1	2011/3/20 15:03
32	61	0.5	9.8	0.6	2011/3/21 10:10
32	90	24.5	12.5	1.1	2011/3/21 10:40
32	75	25.1	24.8	1.9	2011/3/22 11:10
32	75	23.1	24.1	1.8	2011/3/23 12:14
32	65	24.7	23.9	1.6	2011/3/24 11:20
32	65	3.0	13.9	0.9	2011/3/25 12:00
32	63.5	19.6	11.3	0.7	2011/3/25 15:02
32	45	2.4	11.0	0.5	2011/3/26 10:40
32	45				2011/3/26 11:01
Subtotal			260.87	24.94	

Weighting factor resulting from indoor stay of 16 hours multiplied with reduction factor 0.40 (from guideline) 0.60  
 Total radiation mSv for about 11 days from 3/15 15:30 to 3/26 10:50 14.97

				0.0	Days to be elapsed to reach 50mSv
Forecast hereafter	170	24	2.45		14.3
Forecast hereafter	100	24	1.44		24.3
Forecast hereafter	70	24	1.01		34.8

SPEEDI result showed no plume reach before the day 15; the value is assumed to be ignored in this evaluation.

\*: Disaster Prevention Countermeasures for Nuclear Facilities (Attached document 8, Table 2)  
 Reduction factor for wooden house: 0.4



(Reference 2)

Sampling result on the sea surface  
near the Fukushima 1st Nuclear Power Plant

Analyzing the sea water sampled on March 25 from Fukushima 1st Nuclear Power Plant, we detected radioactivity, 50Bq/cm<sup>3</sup> iodine 131 (1251 times the reference value 0.04Bq/cm<sup>3</sup>).

On this issue, some press reported: "Drinking 500ml of the water will cause an exposure of 1mSv". This calculation refers to the equivalent radiation dosage for thyroid gland, a value to be referenced only if stable iodine tablet is taken. It is not appropriate to compare it with the annual radiation dosage 1mSv for the ordinary people. It is moreover unthinkable to use the sea water for drinking purpose.